Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) In a network comprising a plurality of nodes interconnected by optical fiber segments, a method of determining the viability of a signal path through the network, comprising the steps of:

identifying at least one optical effect that impacts the viability of the signal path;

identifying at least one base variable upon which the identified optical effects depend;

approximating a value for the impact of each identified optical effect on the performance of a signal as a function of each identified base variable;

assigning a performance value to the signal at its introduction into the network;

for each successive segment in the signal path, recalculating the impact of each identified optical effect on the performance value as the signal passes through the segment; and

comparing the resulting performance of the signal after passage along the signal path against an acceptable threshold to determine the path's viability.

2. (Original) The method according to claim 1 wherein the step of recalculating comprises the steps of:

calculating the value of each identified base variable;

calculating the impact of each identified optical effect in the segment based on the calculated value of each identified base variable; and

calculating the resulting performance of the signal resulting from the optical effects encountered while passing through the segment.

3. (Original) The method according to claim 2 further comprising the step of:

calculating the resulting performance of the signal resulting from the optical effects encountered while passing through the node at which the segment terminates.

4. (Original) The method according to claim 3 further comprising the steps of:

measuring the current performance of the signal; and

re-calculating the resulting performance of the signal using a measure of the current performance.

5. (Original) The method according to claim 1 wherein an identified base variable is the fiber type.

6. (Original) The method according to claim 1 wherein an identified base variable is the length of the segment.

7. (Original) The method according to claim 1 wherein an identified base variable is the number of wavelengths in the segment.

8. (Original) The method according to claim 1 wherein an identified base variable is the length for each fiber span within the segment.

9. (Original) The method according to claim 1 wherein an identified optical effect is a distortion effect.

10. (Original) The method according to claim 9 wherein the effect is dispersion.

11. (Original) The method according to claim 9 wherein the effect is self-phase modulation.

12. (Original) The method according to claim 9 wherein the effect is cross-phase modulation.

13. (Original) The method according to claim 9 wherein the effect is four-wave mixing.

14. (Original) The method according to claim 1 where an identified optical effect is a noise effect.

15. (Original) The method according to claim 14 wherein the effect is amplified spontaneous emission.

16. (Original) The method according to claim 14 wherein the effect is stimulated Brillouin scattering.

17. (Original) The method according to claim 14 wherein the effect is stimulated Raman scattering.

18. (Original) The method according to claim 14 wherein the effect is multi-path interference.

19. (Original) The method according to claim 1 wherein the approximated function is linear.

20. (Original) The method according to claim 1 wherein the performance is measured by bit error rate.

21. (Original) The method according to claim 1 wherein the performance is measured by optical signal-to-noise ratio.

22. (Original) The method according to claim 1 wherein the performance is measured by Q.

23. (Original) The method according to claim 1 wherein the performance is measured by an accumulation of penalty points.

24. (Previously Presented) In a communications network comprising a plurality of nodes interconnected by segments of optical fiber, a node comprising:

a quantifier to determine the value of at least one identified base variable upon which optical effects that impact the viability of the signal path are dependent;

an approximator to determine the value of the impact of each identified optical effect on the viability of the signal path;

a calculator to determine the impact of each identified optical effect on the performance of a signal passing through a segment in the signal path; and

a comparator to determine if the resulting performance of the signal at the end of the signal path satisfies an acceptable threshold.

25. (Original) The apparatus of claim 24 wherein the node is an OAM (Operations, Administration and Maintenance) node associated with the network.

26. (Previously Presented) In a communications network comprising a plurality of nodes interconnected by segments of optical fiber, a transmitter node, interconnected with at least one downstream node by a downstream segment along which it is adapted to send signals, comprising:

a quantifier to determine the value of at least one identified base variable upon which optical effects that impact the viability of the signal path are dependent for the at least one downstream segment;

an approximator to determine the value of the impact of each identified optical effect on the viability of the signal path along the at least one downstream segment;

a calculator to determine the impact of each identified optical effect on the performance of a signal passing through the at least one downstream segment; and

a communicator for communicating the resulting performance value along the at least one downstream segment to the corresponding downstream node.

27. (Original) The apparatus of claim 26, wherein the performance value is communicated along an OSC channel in the segment.

28. (Previously Presented) In a communications network comprising a plurality of nodes interconnected by segments of optical fiber, an intermediate node interconnected with at least one upstream node by an upstream segment from along which it is adapted to receive signals and with at least one downstream node by a downstream segment along which it is adapted to send signals, comprising:

a receiver for receiving a previous performance value from the at least one upstream node along the segment interconnecting the two nodes;

a quantifier to determine the value of at least one identified base variable upon which optical effects that impact the viability of the signal path are dependent on the at least one downstream segment;

an approximator to determine the value of the impact of each identified optical effect on the viability of the signal path along the at least one downstream segment;

a calculator to determine the impact of each identified optical effect on the performance of a signal passing through the at least one downstream segment; and

a communicator for communicating the resulting performance value along the at least one downstream segment to the corresponding downstream node.

29. (Original) The apparatus of claim 28, wherein the previous performance value is received from along an OSC (Optical Service Channel) channel in the upstream segment.

30. (Original) The apparatus of claim 28, wherein the resulting performance value is communicated along an OSC channel in the downstream segment.

31. (Cancelled)

32. (Cancelled)

33. (Cancelled)

34. (Previously Presented) A computer-readable medium for storing computer-executable instructions which, when executed by a processor in a node in a communications network comprising a plurality of nodes interconnected by segments of optical fiber, cause the node to:

determine the value of at least one identified base variable upon which optical effects that impact the viability of the signal path are dependent;

determine the value of the impact of each optical effect on the viability of the signal path;

determine the impact of each identified optical effect on the performance of a signal passing through a segment in the signal path; and

determine if the resulting performance of the signal at the end of the signal path satisfies an acceptable threshold.

35. (Previously Presented) A computer-readable medium for storing computer-executable instructions which, when executed by a processor in a transmitter node in a communications network, interconnected with at least one downstream node by a downstream segment along which it is adapted to send signals, cause the transmitter node to:

determine the value of at least one base variable upon which optical effects that impact the viability of the signal path are dependent for the at least one downstream segment;

determine the value of the impact of each identified optical effect on the viability of the signal path along the at least one downstream segment;

determine the impact of each identified optical effect on the performance of a signal passing through the at least one downstream segment; and

communicate the resulting performance value along the at least one downstream segment to the corresponding downstream node.

36. (Previously Presented) A computer-readable medium for storing computer-executable instructions which, when executed by a processor in an intermediate node in a communications network, interconnected with at least one upstream node by an upstream segment from along which it is adapted to receive signals and with at least one downstream node by a downstream segment along which it is adapted to send signals, cause the intermediate node to:

receive a previous performance value from the at least one upstream node along the segment interconnecting the two nodes;

determine the value of at least one identified base variable upon which optical effects that impact the viability of the signal path are dependent on the at least one downstream segment;

determine the value of the impact of each identified optical effect on the viability of the signal path along the at least one downstream segment;

determine the impact of each identified optical effect on the performance of a signal passing through the at least one downstream segment; and

communicate the resulting performance value along the at least one downstream segment to the corresponding downstream node.

37. (Cancelled)